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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,130	09/29/2005	Takahiro Kishioka	125473	4076
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/551,130

Applicant(s)

KISHIOKA, TAKAHIRO

Examiner

Cynthia Hamilton

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-9, 11-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3, 5-7 and 9 is/are allowed.
- 6) ☒ Claim(s) 2, 4, 8 and 12 is/are rejected.
- 7) ☒ Claim(s) 8, 11, 13-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 3, 5-7 and 9 are allowed.
2. Claims 11, 13 and 14 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
3. The reasons for allowance of these claims are addressed below.
 - a. The examiner agrees with applicants' arguments with respect to rejections based upon Ishidoya, Kishioka and Meador. The examiner notes for the record that for the first time, applicants have amended all claims to be dependent upon a new limitation of "wherein the resist underlayer anti-reflective coating forming composition contains no strong acid catalyst. Applicants point to paragraph [0013] of their specification for support of this amendment. No clear support for this amendment is found in [0013]. Support is found in the original abstract, [0011]-[0012].
 - b. The examiner notes for the record that Applicants cite that the presence of strong acids yield problems with shelf stability in the antireflective composition. This is well known in the art of curing with acid catalyst of which one solution is to make use of latent acid catalysts to avoid the tendency to gel when using an acid as curing agent as taught by Singer et al (4,469,832) in columns 1-2 and Mizutani et al (US 6,399,269) in column 18, lines 5-25, and Adams et al (US 6,410,209) in column 7-8, and Pavelchek et al (US 2003/0008237) also improves storage stability of antireflective compositions by making use of specific ionic thermal acid generators.. Thus, the problem to be solved with respect to not using an acid as catalyst in an antireflective layer composition to be

cured is known in the art to improve storage stability of acid curable antireflective coating compositions. The solutions given above are to use latent acid catalysts which are not free acids in the stored compositions until sufficiently heated or irradiated to form the acid. The examiner holds that compositions without acid or acid generator needed would have been recognized by workers of ordinary skill in the art not to have this known problem of storage stability if no such acids for cure were present. The examiner notes that the only comparison made by applicants is with a composition having an acid present. There is no addressing the presence of latent acid generators which would generate an acid later as having a storage stability problem by applicants in their comparisons in their original disclosure. Applicants' solution is to avoid the use of "strong acid catalyst" altogether which by the entire disclosure as a whole appear to include the use of latent generators of strong acids as "strong acid catalyst". Economoto et al (US 7,038,328 B2) teach the use of acids which are not "strong" as acid catalysts for crosslinking antireflective compositions in column 7, lines 59-65, when citing acetic acid. However, Economoto et al does not distinguish between the "weak" and "strong" acids in their list of acids and acid generators. Trefonas, III et al (US 7,582,585) at column 4, lines 49-62 reference the exclusion of acid, thermal acid and photoacid generators in the antireflective layers which is also found in the provisional document of Trefonas, III et al making an effective filing date for this reference disclosure December 30, 2003. The examiner notes for the record that all of the instant compositions as claimed have present acid or latent acid whether in the form of carboxylic acid, phenolic hydroxyl or protected carboxyl groups. Thus, the issue is not the exclusion of acid altogether from the

compositions used for antireflective layer formation. The issue is the exclusion of strong acid catalysts, i.e. strong acids and latent strong acid generators from the instant compositions. In view of applicant's arguments with respect to Ishidoya, this is to the exclusion of having used strong acid to make any of the components to make the composition as well as to avoid the smallest of impurities of strong acid catalyst.

c. The examiner believes with respect to the claims above no motivation to form the compositions claimed was found in the prior art of record. The only addressing of using a strong acid TAG or weak acid TAG found by the examiner was in Ding et al but the issue addressed is void fill crosslinking and softbake.

4. The following rejections remain.

5. Claim 8 is objected to because of the following informalities: In claim 8 the q is in the wrong place. It needs to be on the other side of the (H₂C) group as q having 1-6 COOH makes no sense in view of (H₂C) having only one valence and not up to 6. The examiner believes applicants drew a mirror of the other side of the compound and really should have HOOC(CH₂)_q. -Appropriate correction is required.

6. With respect to instant claim 4, applicants added new limits heretofore not part of claim 4 requiring further searching with respect to the strong acid catalyst requirement added by amendment on August 27, 2009. The examiner accepts as "strong acid" that which fully or dissociates in water. Applicants do not define what is meant in their specification. Strong-Acid- Wikipedia is cited for this support as well as Silverstein. If other is meant, applicants need to specify where in the original specification such is set forth or cite prior art to support their position. In view of the possibility of some strong acid being present in the compositions of

Ishidoya et al as argued by applicants, the examiner presents the following new rejections needed due to the amended claim 4.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Nakao et al (US 5,498,514). With respect to instant claim 4, the composition of Example 1 of a copolymer of glycidyl methacrylate and methyl methacrylate made without strong acid dissolved in ethylene glycol monomethyl ether acetate as disclosed by Nakao et al for use as a leveling layer to be used under a photoresist is a species of composition reading on the instant composition of applicant's claim 4 wherein a protected carboxyl group, i.e. methyl protecting as an ester group, is shown. The resist under layer of Nakao et al also has present an ultraviolet absorber as identified in col. 3, lines 54-67, and disclosed to reduce reflectivity from an aluminum substrate as well as to the thermal crosslinkability of the layer in the paragraph bridging col. 4 and 5 of Nakao et al. "A generic claim cannot be allowed to an applicant if the prior art discloses a species falling within the claimed genus." The species in that case will anticipate the genus. *In re Slayter*, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); *In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989).

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao et al (US 5,498,514). With respect to instant claim 4, Nakao et al disclose species which read on the instant compositions as set forth above, but also make obvious a broader group of leveling layers with a copolymer of glycidyl methacrylate and methyl methacrylate made without strong acid mixed with various solvents as set forth in col. 5, lines 14-27, as taught to form coatable layers wherein the solvent used can be evaporated as needed as choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success to solvate the polymer, absorber combination the evaporate the solvent chosen to form the underlayer of Nakao et al.

11. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al (US 6,168,908). With respect to instant claim 4, the thermosetting resin compositions of B-1 to B-5 set forth in Preparation Example 8 and used in the processes of Examples 1-10 of Suzuki et al anticipate the instant genus wherein the copolymers of acid and glycidyl compounds made without strong acid of Suzuki et al read on the instant alternative of a polymer having a carboxyl group. "A generic claim cannot be allowed to an applicant if the prior art discloses a species falling within the claimed genus." The species in that case will anticipate the genus. *In re Slayter*, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); *In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989).

12. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al (5,756,255). With respect to instant claim 4, the compositions of Preparations 2-4 in column 9 of Sato et al is a species of composition anticipating the instant composition of applicant's claim 4 wherein a protected carboxyl group, i.e. methyl protecting as an ester group, is shown. "A generic claim

cannot be allowed to an applicant if the prior art discloses a species falling within the claimed genus.” The species in that case will anticipate the genus. *In re Slayter*, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); *In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989).

13. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Feit et al (US 4,130,424). With respect to instant claim 4, the composition of Example 1 of Feit et al anticipates the instant genus wherein the copolymer of glycidyl methacrylate and ethyl acrylate made in Example 1 is used and anticipates the species of polymer with a protected carboxylic acid.

14. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Nemoto et al (US 5,525,457). With respect to instant claim 4, the compositions of Examples 108 of Nemoto et al have no strong acid present and are disclosed as having no sublimation problems and being storage stable. These compositions anticipate the instant composition of applicant's claim 4.

15. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Hibino et al (JP 58-48048 A) as evidenced by Derwent-ACC-No: 1983-40723K and AN 1983:430757. Hibino et al as evidenced by Derwent-ACC-No: 1983-40723K discloses a species of composition anticipating the composition of instant claim 4 with AN 1983:430757 evidencing the copolymer of benzyl methacrylate-glycidyl methacrylate solvated in methylcellosolve acetate is made without strong acid. The instant protected carboxylic acid is met by benzyl methacrylate. This composition while used for a resist is inherently able to be the antireflective composition as evidenced by applicants own Example 4 in their specification.

Mere recitation of newly discovered function or property, inherently possessed by things in prior art, does not cause claim drawn to those things to distinguish over prior art; Patent Office can

required applicant to prove that subject matter shown to be in prior art does not possess characteristic relied on where it has reason to believe that functional limitation asserted to be critical for establishing novelty in claimed subject matter may be inherent characteristic of prior art; this burden of proof is applicable to product and process claims reasonably considered as possessing allegedly inherent characteristics. In re Best, Bolton and Shaw (CCPA) 195 USPQ 430.

16. Claims 2 and 8 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Lees et al (5,380,804). The formulations of Example 3 Part A of Lees et al anticipate the instant coating compositions of claims 2 and 8 and coated layers therefrom with respect to claim 12. The compositions of Lees et al are inherently able to act as undercoating compositions or to be made into undercoating compositions thus being "forming" capable. The issue of anticipation is specific to the one species of composition reproduced below:

EXAMPLE 3

Part A

Formulations 1 to 17 were prepared using glycidyl methacrylate (GMA) copolymers, and 1,3,5-tris-(2-carboxyethyl)isocyanurate (TCI) crosslinker and a cure catalyst as follows:

A 50 weight percent solution of the GMA copolymer, the TCI crosslinker, and the catalyst in N,N-dimethylformamide (DMF) was prepared and applied to Bonderite® 1000 panels using a #32 wire cator applicator. (Bonderite® is a registered trademark of Parker Chemical Company for phosphated cold rolled steel (CRS). "Iron phosphated CRS" is equivalent to "Bonderite 1000".) After drying at room temperature for a few minutes, the coated panels were placed horizontally in a mechanical forced stream convection oven at a specified temperature/time cure cycle. After curing the panels, the physical and resistance properties of the resulting coatings were measured.

. GMA copolymer is the instant polymer compound having an epoxy group. 1,3,5-tri-(2-carboxyethyl)isocyanurate (TCI) crosslinker is the compound with a molecular weight of 2000 or less having at least two carboxyl group and an s-triazine trione skeleton and dimethylformamide (DMF) is the species of solvent used in the composition of Example 3. This composition has each component set forth in a species of the claimed invention and is coated on a substrate thus is a coating forming composition. What is not disclosed is applicants intended use in

semiconductor device manufacture via a lithography process as a resist underlayer anti-reflective coating. The composition of Example 3 of Lees since it has all of the components as in the instant invention is inherently capable of being so used. No strong acid or strong acid catalyst is used to make or cure the composition as disclosed by Lees, instead the curing catalyst is triphenyl phosphine. Mere recitation of newly discovered function or property, inherently possessed by things in prior art, does not cause claim drawn to those things to distinguish over prior art; Patent Office can require applicant to prove that subject matter shown to be in prior art does not possess characteristic relied on where it has reason to believe that functional limitation asserted to be critical for establishing novelty in claimed subject matter may be inherent characteristic of prior art; this burden of proof is applicable to product and process claims reasonably considered as possessing allegedly inherent characteristics. In *re Best, Bolton and Shaw* (CCPA) 195 USPQ 430. "A generic claim cannot be allowed to an applicant if the prior art discloses a species falling within the claimed genus." The species in that case will anticipate the genus. In *re Slayter*, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); In *re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989). The addition to claim 2 of "a polymer compound produced by addition polymerization" is a product by process limitation. The copolymer of glycidyl methacrylate is made by addition polymerization through the methacrylate group and thus fits the requirements added to the claimed invention. The addition reaction is -C=C- to C-C polymeric bond wherein no atom is lost thus "addition" reaction. With respect to applicant's claim 12, there is no requirement that a coating be formed thus any coating formed anticipates the instant claimed method'.

17. Applicant's arguments filed August 27, 2009 have been fully considered but they are not persuasive. Applicants appear to argue that because Lees does not positively state "no strong acid catalyst is present" the lack of having a strong acid catalyst discloses is insufficient to show such is inherently so. Further, applicants appear to argue "not strong acid catalyst" also includes no cure catalyst as a claim limit. This is not so. First, the cure catalyst of Lees is triphenylphosphine as set forth mid way of column 6 and the comparative compositions of Table 17 and 18 do not even have this cure catalyst present. Further, Lees at column 3, lines 32-60, teach compositions with optional cure catalysts for use in their compositions but do not show any strong acid catalysts in the list. Thus, the claimed invention is still anticipated by the compositions of Lees et al and the claimed invention is not limited to the exclusion of all cure catalysts. The intended use of the instant invention does not remove the anticipation of the composition claimed by those compositions of Lees et al. The rejection stands.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Hamilton whose telephone number is 571-272-1331. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on (571) 272-0729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Hamilton/
Primary Examiner, Art Unit 1795

December 3, 2009